

CLAIMS:

1. A photomask blank comprising a transparent substrate,  
at least one layer of light-shielding film and at least one  
5 layer of antireflective film both on the substrate, wherein  
said light-shielding film and said antireflective film  
are formed of a chromium base material containing oxygen,  
nitrogen and carbon such that the content of carbon  
decreases stepwise or continuously from a surface side  
10 toward the substrate.

2. The photomask blank of claim 1 wherein said light-  
shielding film and said antireflective film each are formed  
of a chromium oxynitride carbide.

3. A photomask fabricated by lithographically patterning  
the photomask blank of claim 1.

4. A method of manufacturing a photomask blank comprising  
20 a transparent substrate, at least one layer of light-  
shielding film and at least one layer of antireflective film  
both on the substrate,

said method comprising the step of forming said light-  
shielding film and said antireflective film by effecting  
25 reactive sputtering using a target of chromium or chromium  
containing at least one element of oxygen, nitrogen and  
carbon and a sputtering gas containing at least carbon  
dioxide gas, a nitrogen-containing gas and an inert gas, so  
that the content of carbon decreases stepwise or  
30 continuously from a surface side toward the substrate.

5. The method of claim 4 wherein said light-shielding  
film and said antireflective film each are formed of a  
chromium oxynitride carbide.

6. The method of claim 5 wherein said reactive sputtering  
step includes changing the proportion of the carbon dioxide

gas in the sputtering gas for controlling the content of carbon in chromium oxynitride carbide of said light-shielding film and said antireflective film.

- 5 7. A method of manufacturing a photomask, comprising the step of lithographically patterning the photomask blank manufactured by the method of claim 4.